

ARL 03-83

Amendments to the Claims:

This listing of Claims will replace all prior versions and listings of Claims in the Application.

Listing of Claims:

Please Amend the Claims as Follows:

Claim 1 (original): A multilayer structure, comprising:

a silicon based substrate; and

an epitaxial $\text{Cd}_{1-z}\text{Zn}_z\text{X}_x\text{X}'_{1-x}$ film grown on the silicon based substrate, where X is a chalcogenide selected from the group consisting of S and Se; X' is a higher atomic number chalcogenide relative to X and X' is selected from the group consisting of S, Se and Te; x is a number greater than zero and less than 1; and z is a number greater than or equal to zero and less than one.

Claim 2 (original): The structure of claim 1 wherein X is Se and X' is Te.

Claim 3 (original): The structure of claim 2 wherein z is zero.

Claim 4 (original): The multilayer structure of claim 1, wherein the silicon based substrate has a CdX' overlayer in contact with the $\text{Cd}_{1-z}\text{Zn}_z\text{X}_x\text{X}'_{1-x}$ film.

ARL 03-83

Claim 5 (original): The multilayer structure of claim 1, wherein the silicon based substrate is a single crystal.

Claim 6 (original): The multilayer structure of claim 1, wherein $x+z$ is less than 0.10.

Claim 7 (original): The multilayer structure of claim 1, wherein $x+z$ is between 0.01 and 0.08.

Claim 8 (original): The multilayer structure of claim 1, wherein $x+z$ is between 0.03 and 0.05.

Claim 9 (original): The multilayer structure of claim 3, wherein x is between 0.01 and 0.08.

Claim 10 (original): The multilayer structure of claim 3, wherein x is between 0.03 and 0.05.

Claim 11 (original): The multilayer structure of claim 1, wherein the $\text{Cd}_{1-z}\text{Zn}_z\text{X}_x\text{X}'_{1-x}$ film has a surface defect density equal to or less than 2000 per centimeter squared.

ARL 03-83

Claim 12 (original): The multilayer structure of claim 11, wherein the surface defect density is less than 500 per square centimeter.

Claim 13 (original): The multilayer structure of claim 1, further comprising a $\text{Hg}_{1-y}\text{Cd}_y\text{Te}$ layer grown on the $\text{Cd}_{1-z}\text{Zn}_z\text{X}_x\text{X}'_{1-x}$ film, the $\text{Hg}_{1-y}\text{Cd}_y\text{Te}$ layer being substantially lattice matched to the $\text{Cd}_{1-z}\text{Zn}_z\text{X}_x\text{X}'_{1-x}$ film.

Claim 14 (original): The multilayer structure of claim 13, wherein X is Se and X' is Te.

Claim 15 (original): The multilayer structure of claim 14, wherein $x+z$ is between 0.01 and 0.08 and y is between 0.15 and 0.35.

Claim 16 (original): The multilayer structure of claim 13, wherein z is zero.

Claim 17 (original): The multilayer structure of claim 16, wherein X is Se and X' is Te.

Claim 18 (original): The multilayer structure of claim 16, wherein x is between 0.01 and 0.08 and y is between 0.15 and 0.35.

ARL 03-83

Claim 19 (original): The multilayer structure of claim 1, further comprising a cadmium chalcogenide layer grown on the $\text{Cd}_{1-z}\text{Zn}_z\text{X}_x\text{X}'_{1-x}$ film.

Claim 20 (currently amended): The multilayer structure of claim ~~44~~ 13 wherein the cadmium chalcogenide layer and the $\text{Cd}_{1-z}\text{Zn}_z\text{X}_x\text{X}'_{1-x}$ film are substantially lattice matched.

Claim 21 (original): A $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film grown by molecular beam epitaxy on a silicon based substrate, where x is a number between zero and one inclusive and z is greater than zero and less than one.

Claim 22 (original): The $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film of claim 21 wherein $x+z$ is less than 0.10.

Claim 23 (original): The $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film of claim 21, wherein the $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film has a surface defect density of less than 2000 per square centimeter.

Claim 24 (original): The $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film of claim 21, having an overlayer of $\text{Hg}_{1-y}\text{Cd}_y\text{Te}$ thereon.

ARL 03-83

Claim 25 (original): The $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film of claim 24, wherein the $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film is substantially lattice matched to the overlayer of $\text{Hg}_{1-y}\text{Cd}_y\text{Te}$.

Claim 26 (original): The film of claim 24, wherein $x+z$ is between 0.01 and 0.08 and y is between 0.15 and 0.35.

Claim 27 (previously amended): The film of claim 21 wherein the $\text{Cd}_{1-z}\text{Zn}_z\text{Se}_x\text{Te}_{1-x}$ film is grown from a $\text{Cd}_{1-z}\text{Zn}_z\text{Te}$ source and a Se source.

Claim 28 (currently amended): A $\text{CdS}_x\text{Te}_{1-x}$ film grown by molecular beam epitaxy on a silicon based substrate, where x is a number between 0 and 1 inclusive, ~~inclusive and z is greater than zero and less than one.~~

Claim 29 (previously amended): The $\text{CdS}_x\text{Te}_{1-x}$ film of claim 28 wherein x is less than 0.10.

Claim 30 (previously amended): The $\text{CdS}_x\text{Te}_{1-x}$ film of claim 28, wherein the $\text{CdS}_x\text{Te}_{1-x}$ film has a surface defect density of less than 2000 per square centimeter.

ARL 03-83

Claim 31 (previously amended): The $\text{CdS}_x\text{Te}_{1-x}$ film of claim 28, having an overlayer of $\text{Hg}_{1-y}\text{Cd}_y\text{Te}$ thereon.

Claim 32 (previously amended): The $\text{CdS}_x\text{Te}_{1-x}$ film of claim 31, wherein the $\text{CdS}_x\text{Te}_{1-x}$ film is substantially lattice matched to the overlayer of $\text{Hg}_{1-y}\text{Cd}_y\text{Te}$.

Claim 33 (original): The film of claim 31, wherein x is between 0.01 and 0.08 and y is between 0.15 and 0.35.

Claim 34 (previously amended): The film of claim 28 wherein the $\text{CdS}_x\text{Te}_{1-x}$ film is grown from a CdTe source and a ~~Se~~ S source.

Claims 35-68 (Canceled).